

IN THE DRAWINGS:

Submitted herewith is a replacement sheet for Fig. 14 incorporating a revision to overcome the drawing objection. More specifically, Fig. 14 has been revised to insert the legend "Prior Art".

REMARKS

In the last Office Action, the Examiner withdrew claims 6-12 from further consideration as being directed to a non-elected invention. The drawings were objected to because Fig. 14 is not designated with the legend "Prior Art" and because reference numeral 13 in Fig. 11 is not mentioned in the specification. The specification and claim 4 were objected to as containing informalities. Claims 2-5 were rejected under 35 U.S.C. §112, second paragraph, for indefiniteness. Claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,189,374 to Adderton et al. Additional art was cited of interest.

In accordance with the present response, the specification has been suitably revised to correct informalities, including those noted by the Examiner, to provide antecedent basis for the claim language, and to bring it into better conformance with U.S. practice. Original dependent claims 2 and 3 have been rewritten as new independent claims 13 and 18, respectively, to incorporate the subject matter of base claim 1. Claim 4 has been rewritten as new independent claim 23.

New independent claims 13, 18 and 23 also overcome the objection and indefiniteness rejection raised by the Examiner and improve the wording of the original claims. For

example, independent claim 13, which corresponds to the subject matter of original claim 2, explicitly defines the parameters G , A , A_0 and G_0 in the equation $G = (A/A_0) * G_0$. Likewise, independent claim 18, which corresponds to the subject matter of original claim 3, explicitly defines the parameters G and L in the expression $G \propto 1/L$.

Claims 1 and 5 have been canceled without prejudice or admission, thereby rendering the indefiniteness rejection (claims 1, 5) and prior art rejection (claim 1) of these claims moot. Non-elected claims 6-12 have been canceled without prejudice or admission and subject to applicants' right to file a continuing application to pursue the subject matter of the non-elected claims. New claims 14-17 and 19-22 have been added to provide a fuller scope of coverage. A new abstract which more clearly reflects the invention to which the new claims are directed has been substituted for the original abstract.

Submitted herewith is a replacement sheet for Fig. 14 incorporating a revision to overcome the drawing objection. More specifically, Fig. 14 has been revised to insert the legend "Prior Art".

In view of the foregoing, applicants respectfully submit that the objections to the specification, drawings and claims, the rejection of the claims under 35 U.S.C. §112,

second paragraph, and the prior art rejection have been either overcome or rendered moot and, therefore, should be withdrawn.

Applicants respectfully submit that the prior art of record does not disclose or suggest the subject matter recited in newly added claims 13-23.

New independent claim 13 is directed to a scanning probe microscope. With reference to the embodiment shown in Fig. 1, the scanning probe microscope has a cantilever 1 having a probe 2 at a distal end thereof. An oscillator 4 generates a resonance signal near a resonance of the cantilever 1. The scanning probe microscope also has vibrating means 3 (e.g., piezoelectric elements) for receiving the resonance signal generated by the oscillator 4 as a driving signal to vibrate the cantilever 1 while the probe 2 is in close proximity to a surface of a sample, and extracting means (e.g., phase shifter 8) for extracting a displacement signal corresponding to displacement of the cantilever 1 during vibration thereof. A variable gain amplifier 9 adjusts a gain of the displacement signal extracted by the extracting means so as to satisfy the equation $G=(A/A_0)*G_0$ to control a quality factor value (Q-value) of the cantilever resonance to an optimal quality factor value, where G represents a gain value of the variable gain amplifier, A represents a preselected oscillation

amplitude of the oscillator, A_0 represents an initial oscillation amplitude of the oscillator, and G_0 represents a gain value of the variable gain amplifier when the initial oscillation amplitude of the oscillator is A_0 . An adder superimposes an output signal from the variable gain amplifier 9 with an output signal from the oscillator 4 to generate a signal for use as the driving signal received by the vibrating means 3 for vibrating the cantilever 1. As recognized by the Examiner, no corresponding structural and functional combination is disclosed or suggested by the prior art of record.

New independent claim 18 requires the same structure and corresponding functions of the elements described above for independent claim 13 except for the variable gain amplifier 9. In independent claim 18, the variable gain amplifier 9 adjusts a gain of the displacement signal extracted by the extracting means so as to satisfy the expression $G \propto 1/L$ to control a quality factor value (Q-value) of the cantilever resonance to an optimal quality factor value, where G represents a gain value of the variable gain amplifier and L represents a distance between the probe 2 and the sample. Again, as recognized by the Examiner, no corresponding structural and functional combination is disclosed or suggested by the prior art of record.

New independent claim 23 is directed to a method of operating a scanning probe microscope comprised of a cantilever probe having a probe tip at a distal end thereof for scanning a surface of a sample. Claim 23 requires the steps of displacing the cantilever probe so that the probe tip approaches the surface of the sample, acquiring a point corresponding to a first position of the cantilever probe at which a distance between the probe tip and the surface of the sample is zero, displacing the cantilever probe to a second position different from the first position using the acquired point as a reference by raising the probe tip to a first distance from the surface of the sample, controlling at the second position of the cantilever probe a quality factor value of the resonance of the cantilever probe to an optimal quality factor value, displacing the cantilever probe to a third position different from the second position so that probe tip is disposed at a second distance from the surface of the sample different from the first distance, and controlling at the third position of the cantilever probe a quality factor value of the resonance of the cantilever probe to an optimal quality factor value. No corresponding combination of steps is disclosed or suggested by the prior art of record.

New claims 14-17 and 19-22 depend on and contain all of the limitations of new independent claims 13 and 18,

respectively, and, therefore, distinguish from the prior art of record at least in the same manner as claims 13 and 18.

In view of the foregoing amendments and discussion, the application is believed to be in allowable form. Accordingly, favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

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Name



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March 10, 2005

Date